CLAIMS

1. Brazing method for, through melting of a connecting agent then solidification of this connecting agent, achieving a mechanical and electrical connection between at least one first face (2), of a first piece (200), and at least one second face (3), of a second piece (300), said first piece (200) and said second piece (300) being constituents of an electro-technical device (4),

- the first piece (200) being made starting from

  - at least one first metallic material (202) in the form of a foil (201) of a given thickness, this first material (202) comprising a main constituent (203), referred to as the first main constituent (203), said first metallic material having a defined temperature of complete solidification (solidus) (T2), referred to as the first complete solidification temperature (T2), and

  - at least one dielectric interfacing material,

- the second piece (300), on the one hand, having, in a direction substantially orthogonal to the second face (3), a dimension (D) appreciably greater than the thickness (E) of the first metallic material (202) in foil form (201) making up the first piece (200), and, on the other hand, being composed of a metallic material (302), referred to as the second metallic material (302), comprising a main constituent (303), referred to as the second main constituent (303), at least substantially similar to the first main constituent (203) of the first metallic material (202), said second metallic material (302) likewise having a temperature of complete solidification (solidus) (T3), also defined, referred to as the second temperature of complete solidification (T3),

this brazing method being characterised in that used is a connecting agent made up beforehand of a metallic material (102) which, referred to as the third metallic material (102), comprises a main constituent (103), referred to as the third main constituent (103), at least substantially similar to the first main

constituent (203), this third metallic material (102) having however a temperature of complete melting (liquidus) (T1) which is lower, on the one hand, than the first complete solidification temperature (T2), and, on the other hand, than the second complete solidification temperature (T3).

2. Brazing method according to claim 1, characterised in that:

- chosen is a connecting agent having a defined third complete solidification temperature (T4),

- with the connecting agent at least one fusible element (100) is constituted able to be placed in contact with at least one of the faces which are the first face (2), of the first piece (200), and the second face (3), of the second piece (300), and

- after having placed the fusible element (100) in contact, at one and the same time, with the first face (2), of the first piece (200), and the second face (3), of the second piece (300), the second piece (300) is heated locally with a predetermined amount of energy, and this for a first duration (D1), likewise predetermined, so as to generate firstly solely the melting of the connecting agent, and then secondly the cooling of said connecting agent to a defined temperature lower than the defined third complete solidification temperature (T4).

3. Brazing method according to claim 1, characterised in that the step of heating of the second piece (300) is begun instantaneously starting from a defined ambient temperature (T5), without this second piece (300) having to have been heated beforehand in order to bring it to a temperature close to the temperature for complete melting (liquidus) (T1) of the connecting agent.

4. Brazing method according to claim 1, characterised in that at the end of the step during which the second piece (300) is heated for a predetermined duration, one proceeds to a controlled cooling of said second piece (300) so as to remove the energy related to the heating, and this in a

second predetermined duration (D2) so as to prevent any thermal degradation of said first and second pieces (200, 300).

5. Brazing method according to any one of the claims 1 to 4, characterised in that it uses:

- a first metallic material (202) having a main constituent (203), referred to as the first main constituent (203), which is of aluminium,

- a second metallic material (302) having a main constituent (303), referred to as the second main constituent (303), which is of aluminium, and

- a third metallic material (102) consisting of an alloy with a main constituent (103), referred to as the third main constituent (103), which is of aluminium.

6. Brazing method according to any one of the claims 1 to 5, characterised in that used is a first metallic material (202) and a second metallic material (302) whose complete solidification temperatures, referred to as first complete solidification temperature (T2) and second complete solidification temperature (T3), are at least substantially similar to one another.

7. Brazing method according to any one of the claims 1 to 5, characterised in that used is a first metallic material (202) and a second metallic material (302) whose complete solidification temperatures, referred to as first complete solidification temperature (T2) and second complete solidification temperature (T3), are different from one another.

8. Brazing method according to any one of the claims 1 to 7, characterised in that it uses:

- a first metallic material (202) and a second metallic material (302) consisting of aluminium having a complete solidification temperature (solidus), referred to as the first complete solidification temperature (T2) which is at least equal to six hundred thirty-five degrees Celsius (635°C),

- a connecting agent consisting of an alloy of aluminium and of silicon with a percentage by mass of silicon which ranges between seven percent and thirteen percent (7% and 13%) silicon and having a complete melting (liquidus) temperature which is at most equal to six hundred thirteen degrees Celsius (613°).

9. Brazing method according to any one of the claims 1 to 8, characterised in that it uses a first metallic material (202) and a second metallic material (302) comprising aluminium containing at least one of the elements which are silicon, magnesium, manganese, copper, iron, with percentages by mass which are such that this first metallic material (202) has a complete solidification temperature (solidus), referred to as the first complete solidification temperature (T2), which is at least equal to six hundred thirty-five degrees Celsius (635°C).

10. Brazing method according to any one of the claims 1 to 8, characterised in that it uses a first metallic material (202) and a second metallic material (302) comprising aluminium containing, in particular, silicon, with a percentage by mass of silicon which ranges between zero point twenty-five and zero point fifty (0.25 and 0.50) and having a complete solidification temperature (solidus), referred to as the first complete solidification temperature (T2), which is at least equal to six hundred thirty-five degrees Celsius (635°C).

11. Brazing method according to any one of the claims 1 to 10, characterised in that it uses:

-at least one first piece (200) consisting of at least a group of two electrodes separated by at least one element of dielectric interfacing material, at least one of these electrodes being made starting from a foil (201) of a first metallic material (202) of very slight thickness, the grouping of said electrodes being achieved such that at least one of these electrodes has a free edge (20) which extends while thus forming the first face (2) of the first piece (200),

- at least one other piece (300), forming an electrical terminal, hereinafter referred to as the second piece (300), intended to be connected

mechanically and electrically to the first piece (200), and i.e. to one of the electrodes which it comprises, this second piece (300) being made up such that it has a second face (3) able to be substantially superimposed on the first face (2) of the first piece (200).

12. Brazing method according to any one of the claims 1 to 11, characterised in that to heat locally the second piece (300) with a predetermined amount of energy, and this for a first duration (D1), likewise predetermined, so as to generate firstly solely the melting of the connecting agent of the fusible element (100), then, secondly, the cooling of said connecting agent, an induction heating device (5) is used having an induction coil (51) and an apparatus (52) for supplying the induction coil with power, of determined frequency.

13. Brazing method according to any one of the claims 1 to 11, characterised in that to heat locally the second piece (300) with a predetermined amount of energy, and this for a first duration (D1), likewise predetermined, so as to generate firstly solely the melting of the connecting agent of the fusible element (100), then, secondly, the cooling of said connecting agent, a heating device is used employing an electromagnetic field.

14. Brazing method according to claim 12, characterised in that when heating the second piece (300), the piece is set in rotation on the induction coil (51) in such a way as to make the heating uniform.

15. Brazing method according to any one of the claims 1 to 14, characterised in that when heating the second piece (300) the first piece (200) is forced against the second piece (300).

16. Electro-technical devices comprising at least one first piece (200) and at least one second piece (300) between which a mechanical and electrical connection is achieved according to the brazing method of any one of the claims 1 to 15.

17. The electro-technical device of claim 16, where the second piece (300) defines a housing.

18. The electro-technical device of claim 17, where the first piece (200) is a capacitor electrode.

19. The electro-technical device of claim 17, where the first piece (200) is a battery electrode.

20. The electro-technical device, of claim 18 or 19, where the first piece (200) comprises carbon particles.

21. The electro-technical device of claim 18, where the capacitor electrode is a double-layer capacitor electrode.